

**INTERDIGITAL, INC., )  
INTERDIGITAL VC HOLDINGS, )  
INC., INTERDIGITAL PATENT )  
HOLDINGS, INC., and )  
INTERDIGITAL MADISON )  
PATENT HOLDINGS SAS. )**

## JURY TRIAL DEMANDED

**v.**

**LENOVO (UNITED STATES) INC.,** )  
**MOTOROLA MOBILITY LLC, AND** )  
**LENOVO PC HK LIMITED,** )

## AMENDED JOINT CLAIM CONSTRUCTION STATEMENT

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identification of extrinsic evidence to support their proposed constructions. InterDigital's identification of extrinsic evidence is attached hereto as Appendix B. Lenovo's identification of extrinsic evidence is attached hereto as Appendix C. The Parties each reserve the right to rely on intrinsic and extrinsic evidence relied upon by the other party.

The Parties anticipate that the claim construction hearing will require no more than 6 hours. The Parties reserve the right, but do not intend, to call any experts for live testimony. The Parties may submit declarations from their identified experts explaining the technological background for the '877, '859, and '556 Patents, a description of how a person of ordinary skill in the art would understand the disputed claim terms, and the identification of the function and structure, if any, associated with the terms subject to means-plus-function treatment, which are identified in Appendix A hereto.

The Parties hereby agree that they may rely upon the expert declarations, deposition testimony, and associated exhibits from Dr. Iain Richardson and Dr. Michael Orchard developed in the related investigation before the International Trade Commission, *In the Matter of Certain electronic Devices, Including Smartphones, Computers, Tablet Computers, and Components Thereof*, Inv. No. 337-TA-1373 (U.S.I.T.C).

Dated: April 12, 2024

Respectfully Submitted,

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## APPENDIX A

### I. Agreed Terms

Term	Claim(s)	Agreed Construction
wherein subset comprises	'859 (15)	"wherein said subset comprises"
compression constraint	'556 (2, 6)	Plain and ordinary meaning
circuit configured to	'877 (7, 8)	Plain and ordinary meaning (i.e., requires pre-existing programming of hardware and software to perform the cited functionality)

### II. Disputed Terms

Term	Claim(s)	InterDigital's Construction and Identification of Intrinsic and Extrinsic Evidence	Lenovo's Construction and Identification of Intrinsic and Extrinsic Evidence
arithmetic decoding method for symbols coded in the form of a stream, comprising the following steps applied at switching points distributed in said stream to decode a current symbol	'859 (10)	<p><b>Proposed construction:</b> The terms "stream" and "current symbol" are limiting at least to the extent that they provide antecedent basis for those terms as they appear elsewhere in the claim.</p> <p><u>stream</u>: stream of data.</p> <p><u>switching point</u>: a point in the stream at the level of which the probability model used to code the current symbol can be modified.</p> <p><u>current symbol</u>: a symbol that is currently being decoded.</p>	<p>The portion of this claim term following "comprising" is not part of the preamble and therefore is limiting. Regardless, the entire term is limiting. The preamble is limiting.</p> <p>To the extent construction is necessary, <u>stream</u>: "stream of data"</p> <p><u>current symbol</u>: "a symbol that is currently being decoded"</p> <p><u>switching point</u>: "a point in the stream at the level of which the probability model used to</p>

		<p><b>Intrinsic evidence supporting InterDigital’s construction:</b> ’859 Patent at 4:57-60, 9:56-59, 10:65-11:1; ’859 Patent file history (IDG1373_0000211-221)</p> <p><b>Extrinsic evidence supporting InterDigital’s construction:</b> Expert testimony of Dr. Richardson regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue, background, and context surrounding the technology at issue. The experts’ testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p> <p><i>See also</i> Appendix B.</p>	<p>code the current symbol can be modified— i.e., a probability model can be selected”</p> <p><b>Intrinsic evidence supporting Lenovo’s construction:</b> ’859 patent at 1:23-2:34, 9:46-54, 4:21-60, 5:8-46, 6:44-46, 8:55-57, 9:51-59, 10:21-23, 10:64-11:64, and associated Figures including 1, 2, 9, 10, and 11. Related patents and file histories including EP2449683.</p> <p><b>Extrinsic evidence supporting Lenovo’s construction:</b> Expert testimony of Dr. Orchard regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue, background, and context surrounding the technology at issue. The experts’ testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p> <p><i>See also</i> Appendix C.</p>
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<p>means for decoding from the stream, at switching points distributed in said stream to decode a current symbol, for said current symbol, a probability model identifier</p>	<p>'859 (15)</p>	<p><b>Proposed construction:</b> Subject to § 112, ¶ 6.</p> <p><u>Function:</u> decoding from the stream . . . a probability model identifier</p> <p><u>Structure:</u> an arithmetic decoder and equivalents thereof. <i>See</i> '859 Patent at FIG. 13, 13:25-52.</p> <p>Alternatively, the structure is an arithmetic decoder operable to perform the claimed function, as described in the specification in connection with step 202 and equivalents thereof, step 202 being described in the specification, for example at the following figures and passages: '859 Patent at FIG. 13 and 13:25-52 and FIGS. 10, 11 and 10:1-14, 11:12-34.</p> <p><b>Intrinsic evidence supporting InterDigital's construction:</b> '859 Patent at 1:23-58, 2:17-18, 4:33-5:7, 6:34-30, 10:1-13, 10:64-11:52, 13:32-35, 13:53-61; FIG. 4, 11, 13; '859 Patent file history (IDG1373_0000211-221)</p> <p><b>Extrinsic evidence supporting InterDigital's construction:</b> Expert testimony of Dr. Richardson regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue, background, and context</p>	<p>Subject to § 112, ¶ 6.</p> <p><u>Function:</u> decoding a probability model identifier for the current symbol from the stream, at switching points distributed in the stream</p> <p><u>Structure:</u> indefinite for lack of sufficient corresponding structure.</p> <p><b>Intrinsic evidence supporting Lenovo's construction:</b> '859 patent at 1:23-2:11, 2:29-34, 9:46-54, 4:27-28, 4:56-60, 5:8-46, 10:1-17, 10:64-11:34, 11:55-64, 13:25-14:2, and associated Figures including 1, 2, 9-11 and 13.</p> <p><b>Extrinsic evidence supporting Lenovo's construction:</b> Expert testimony of Dr. Orchard regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue, background, and context surrounding the technology at issue. The experts' testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p> <p><i>See also</i> Appendix C.</p>
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		<p>surrounding the technology at issue. The experts' testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p> <p><i>See also Appendix B.</i></p>	
<p>means for selecting using said probability model identifier a probability model in a set comprising a current probability model defined from symbols coded previous to the current symbol and a subset of probability models wherein subset comprises at least one probability model defined by default</p>	'859 (15)	<p><b>Proposed construction:</b> Subject to § 112, ¶ 6.</p> <p><u>Function:</u> selecting . . . a probability model</p> <p><u>Structure:</u> an arithmetic decoder and equivalents thereof. <i>See</i> '859 Patent at FIG. 13 and 13:25-52.</p> <p>Alternatively, the structure is an arithmetic decoder operable to perform the claimed function, as described in the specification in connection with step 204 and equivalents thereof, step 204 being described in the specification, for example at the following figures and passages: '859 Patent at FIG. 13 and 13:25-52 and FIGS. 10, 11 and 5:36-43, 10:1-17, 11:12-36.</p> <p><b>Intrinsic evidence supporting InterDigital's construction:</b> '859 Patent at 2:17-18, 5:35-43, 6:34-40, 8:4-7, 10:1-19; 11:12-36, 13:25-52, FIGS.10, 11; '859 Patent file history (IDG1373_0000211-221)</p> <p><b>Extrinsic evidence supporting InterDigital's construction:</b> Expert</p>	<p>Subject to § 112, ¶ 6</p> <p><u>Function:</u> using the probability model identifier to select a probability model in a set comprising a current probability model defined from symbols coded previous to the current symbol and a subset of probability models wherein said subset comprises at least one probability model defined by default</p> <p><u>Structure:</u> indefinite for lack of sufficient corresponding structure</p> <p><b>Intrinsic evidence supporting Lenovo's construction:</b> '859 Patent at 1:23-2:11, 2:29-34, 4:27-28, 4:56-60, 5:8-46, 9:46-54, 4:56-60, 10:1-17, 10:64-11:36, 11:55-64, 13:25-14:2, and associated Figures including 1, 2, 9-11 and 13.</p> <p><b>Extrinsic evidence supporting Lenovo's construction:</b> Expert testimony of Dr. Orchard regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue,</p>

		<p>testimony of Dr. Richardson regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue, background, and context surrounding the technology at issue. The experts' testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p> <p><i>See also</i> Appendix B.</p>	<p>background, and context surrounding the technology at issue. The experts' testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p> <p><i>See also</i> Appendix C.</p>
means for adding in said subset said current probability model, the selected probability model becoming the current probability model	'859 (15)	<p><b>Proposed construction:</b> Subject to § 112, ¶ 6.</p> <p><u>Function:</u> adding in said subset said current probability model</p> <p><u>Structure:</u> an arithmetic decoder and equivalents thereof. <i>See</i> '859 at FIG. 13 and 13:25-52.</p> <p>Alternatively, the structure is an arithmetic decoder operable to perform the claimed function, as described in the specification in connection with step 205 and equivalents thereof, step 205 being described in the specification, for example at the following figures and passages: '859 Patent at FIG. 13 and 13:25-52 and FIGS. 8, 10, 11 and 11:37-43 (describing 205 and additionally that step 205 can be identical to step 105), FIG. 7 and 8:8-37 (describing step 105).</p>	<p>Subject to § 112, ¶ 6</p> <p><u>Function:</u> adding the current probability model into the subset of probability models</p> <p><u>Structure:</u> indefinite for lack of sufficient corresponding structure.</p> <p><b>Intrinsic evidence supporting Lenovo's construction:</b> '859 Patent at 1:23-2:11, 2:29-34, 4:27-28, 4:56-60, 5:8-46, 8:8-37, 9:46-54, 10:1-17, 10:64-11:43, 11:55-64, 13:25-14:2, and associated Figures including 1, 2, 9-11 and 13.</p> <p><b>Extrinsic evidence supporting Lenovo's construction:</b> Expert testimony of Dr. Orchard regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue, background, and context surrounding the</p>

		<p><b>Intrinsic evidence supporting InterDigital’s construction:</b> ’859 Patent at 2:17-18, 4:21-54, 8:8-46, 11:7-54; 13:25-54; FIG. 11; ’859 Patent file history (IDG1373_0000211-221)</p> <p><b>Extrinsic evidence supporting InterDigital’s construction:</b> Expert testimony of Dr. Richardson regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue, background, and context surrounding the technology at issue. The experts’ testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p> <p><i>See also</i> Appendix B.</p>	<p>technology at issue. The experts’ testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p> <p><i>See also</i> Appendix C.</p>
means for decoding said current symbol with said current probability model	’859 (15)	<p><b>Proposed construction:</b> Subject to § 112, ¶ 6.</p> <p><u>Function:</u> decoding said current symbol</p> <p><u>Structure:</u> an arithmetic decoder and equivalents thereof. <i>See</i> ’859 Patent at FIG. 13 and 13:25-52.</p> <p>Alternatively, the structure is an arithmetic decoder operable to perform the claimed function, as described in the specification in connection with step 206 and equivalents thereof, step 206 being described in the specification, for example at the following</p>	<p>Subject to § 112, ¶ 6</p> <p><u>Function:</u> decoding the current symbol with the current probability model</p> <p><u>Structure:</u> indefinite for lack of sufficient corresponding structure.</p> <p><b>Intrinsic evidence supporting Lenovo’s construction:</b> ’859 patent at 1:23-2:11, 2:29-34, 4:27-28, 4:56-60, 5:8-46, 8:8-37, 9:46-54, 10:1-9, 10:64-11:64, 13:25-14:2, and associated Figures including 1, 2, 7-11, and 13.</p>

		<p>figures and passages: '859 Patent at FIG. 13 and 13:25-52 and FIGS. 10, 11 and 10:18-19, 11:55-57.</p> <p><b>Intrinsic evidence supporting InterDigital's construction:</b> '859 Patent at 1:23-54, 2:17-18, 4:21-24, 4:33-54, 9:53-54, 10:18-19, 11:55-57, 13:25-52, FIG. 11, 13; '859 Patent file history (IDG1373_0000211-221)</p> <p><b>Extrinsic evidence supporting InterDigital's construction:</b> Expert testimony of Dr. Richardson regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue, background, and context surrounding the technology at issue. The experts' testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p> <p><i>See also</i> Appendix B.</p>	<p><b>Extrinsic evidence supporting Lenovo's construction:</b> Expert testimony of Dr. Orchard regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue, background, and context surrounding the technology at issue. The experts' testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p> <p><i>See also</i> Appendix C.</p>
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means for updating said current probability model according to the decoding of said current symbol	'859 (15)	<p><b>Proposed construction:</b> Subject to § 112, ¶ 6</p> <p><u>Function:</u> updating said current probability model</p> <p><u>Structure:</u> an arithmetic decoder and equivalents thereof. <i>See</i> '859 Patent at FIG. 13 and 13:25-52.</p> <p>Alternatively, the structure is an arithmetic decoder operable to perform the claimed function, as described in the specification in connection with step 208 and equivalents thereof, step 208 being described in the specification, for example at the following figures and passages: '859 Patent at FIG. 13 and 13:25-52 and FIGS. 10, 11, 4:33-54, 10:20-22, 11:57-61.</p> <p><b>Intrinsic evidence supporting InterDigital's construction:</b> '859 Patent at 1:34-54, 2:17-18, 4:33-54, 5:45-46; 6:45-46; 8:56-57, 10:22-23, 11:57-59, 13:32-35, FIG. 10, 11; '859 Patent file history (IDG1373_0000211-221)</p> <p><b>Extrinsic evidence supporting InterDigital's construction:</b> Expert testimony of Dr. Richardson regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue, background, and context</p>	<p>Subject to § 112, ¶ 6</p> <p><u>Function:</u> updating the current probability model according to the decoding of the current symbol</p> <p><u>Structure:</u> an algorithm wherein an occurrence number for the current symbol is increased by 1</p> <p><b>Intrinsic evidence supporting Lenovo's construction:</b> '859 Patent at 1:23-2:11, 2:29-34, 4:27-60, 5:8-46, 8:8-37, 9:46-54, 10:1-22, 10:64-11:64, 13:25-14:2, and associated Figures including 1, 2, 7-11, and 13.</p> <p><b>Extrinsic evidence supporting Lenovo's construction:</b> Expert testimony of Dr. Orchard regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue, background, and context surrounding the technology at issue. The experts' testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p> <p><i>See also</i> Appendix C.</p>
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		<p>surrounding the technology at issue. The experts’ testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p> <p><i>See also</i> Appendix B.</p>	
sparse denoising filter	’556 (1, 5)	<p><b>Proposed construction:</b> Plain and ordinary meaning.</p> <p><b>Intrinsic evidence supporting InterDigital’s construction:</b> ’556 Patent cls. 4, 8; 1:12-17, 1:58-63, 2:4-62, 5:7-12,14:18-24, 9:23-28, 9:44-48, 10:8-23, 10:62-11:1, 11:16-19, 11:56-67, 13:21-65, 16:43-47, 17:11-18, 17:30-36; ’556 Patent file history (IDG1373_00010395)</p> <p><b>Extrinsic evidence supporting InterDigital’s construction:</b> Expert testimony of Dr. Richardson regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue, background, and context surrounding the technology at issue. The experts’ testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p> <p><i>See also</i> Appendix B.</p>	<p>The portion of this claim term following “comprising” is not part of the preamble and therefore is limiting. Regardless, the entire term is limiting. The preamble is limiting.</p> <p>To the extent construction is necessary, <u>stream</u>: “stream of data”</p> <p><u>current symbol</u>: “a symbol that is currently being decoded”</p> <p><u>switching point</u>: “a point in the stream at the level of which the probability model used to code the current symbol can be modified— i.e., a probability model can be selected”</p> <p><b>Intrinsic evidence supporting Lenovo’s construction:</b> ’556 patent at 2:8-10, 2:14-21, 13:24-25, 13:43-44, 11:17-24, and associated Figures including 1, 4, and 5. Patents and prosecution history for related patents including U.S. 9,277,243, U.S. 11,089,337, and PCT/US2007022795.</p>

			<p><b>Extrinsic evidence supporting Lenovo’s construction:</b> Expert testimony of Dr. Orchard regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue, background, and context surrounding the technology at issue. The experts’ testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p> <p><i>See also Appendix C.</i></p>
adaptive sparse de-noising filter	’556 (1, 5)	<p><b>Proposed construction:</b> Plain and ordinary meaning.</p> <p><b>Intrinsic evidence supporting InterDigital’s construction:</b> ’556 Patent at 2:10-14, 10:57-59, 16:25-42, 16:65-17:4, 17:5-10; ’556 Patent file history (IDG1373_00010395)</p> <p><b>Extrinsic evidence supporting InterDigital’s construction:</b> Expert testimony of Dr. Richardson regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue, background, and context surrounding the technology at issue. The experts’ testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p>	<p>“sparse de-noising filter for performing a second pass to reduce noise, which is not a deringing filter, that can adjust its own parameters automatically”</p> <p>Alternatively, “a filter which exploits a sparse image model using an over complete set of linear transforms and hard thresholding, which is not a deringing filter, that can adjust its own parameters automatically.”</p> <p><b>Intrinsic evidence supporting Lenovo’s construction:</b> ’556 patent at 2:10-14, 2:4-9, 13:53-56, 11:64-66, 12:1-42, and associated Figures including 1, 4, and 5. Patents and prosecution history for related patents including U.S. 9,277,243, U.S. 11,089,337, and PCT/US2007022795.</p>

		<p><i>See also</i> Appendix B.</p>	<p><b>Extrinsic evidence supporting Lenovo’s construction:</b> Expert testimony of Dr. Orchard regarding the understanding of one of skill in the art including but not limited to the level of ordinary skill in the art, understanding of the claim term at issue, background, and context surrounding the technology at issue. The experts’ testimony may discuss the relevant specifications, file histories, and other extrinsic evidence disclosed herein.</p> <p><i>See also</i> Appendix C.</p>
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## APPENDIX B

The below table contains extrinsic evidence in support of InterDigital's position as to the proper construction of the terms proposed for construction in the '859, '877, and '556 Patents.

Description and Title of Extrinsic Evidence
M. Elad, "Sparse Representations Are Most Likely to Be the Sparsest Possible," <i>EURASIP Journal on Applied Signal Processing</i> , vol. 2006, article ID 96247, pgs. 1- 12. (IDG1373_0018207–18218)
D. Donoho and I. Johnstone, "Ideal Spatial Adaption by Wavelet Shrinkage," <i>Dep 't. of Statistics, Stanford University</i> , April 1993. (IDG1373_0018219–18248)
R. Gribonval and M. Nielsen, "Sparse Approximations in Signal and Image Processing – Editorial," <i>Signal Processing</i> , Elsevier, 2006, special issue on Sparse Approximations in Signal and Image Processing, 86 (3), pp. 415-416 . (IDG1373_0018249–252)
D. Donoho, "Compressed Sensing," <i>IEEE Transactions on Information Theory</i> , vol. 52, no. 4, April 2006 . (IDG1373_0018253–18270)
Guleryuz, Onur G., "A Nonlinear Loop Filter for Quantization Noise Removal in Hybrid Video Compression," IEEE International Conference on Image Processing (Sept. 14, 2005). (IDG1373_0045478–45492)
W. B. Pennebaker & Joan L. Mitchel, JPEG: Still Image Data Compression Standard, 8th ed. (1993), Table of Contents.
Ian H. Witten et al., "Arithmetic Coding for Data Compression," <i>Computing Practices</i> , Vol. 30 (June 1987).
W.B. Pennebaker et al., "An overview of the basic principles of the Q-Coder adaptive binary arithmetic coder," 32 IBM J. Res. Develop. 717 (Nov. 1988).
A. Moffat, "Arithmetic Coding Revisted," 16 ACM Transactions on Information Sys. 256 (July 1998).
Richardson, I., The H.264 Advanced Video Compression Standard (2nd Ed. 2010), WILEY. (LENOVO_1373-00161250–598)

## APPENDIX C

The below table contains extrinsic evidence in support of Lenovo's position as to the proper construction of the terms proposed for construction in the '859, '877, and '556 Patents.

Description and Title of Extrinsic Evidence
U.S. Patent No. 7,932,843 LENOVO_EDNC_00000226
U.S. Patent No. 8,351,502 LENOVO_EDNC_00000247
U.S. Patent No. 8,416,857 LENOVO_EDNC_00000280
U.S. Patent No. 8,718,149 LENOVO_EDNC_00000299
U.S. Patent No. 9,008,171 B2 LENOVO_EDNC_00000384
U.S. Patent No. 9,386,316 LENOVO_EDNC_00000409
Excerpts from File History for European Pat. Pub. No. 7 870 824 LENOVO_EDNC_00000436
Excerpts from File History for U.S. Pat. App. No. 17/367184 LENOVO_EDNC_00000914
Excerpts from File History for U.S. Pat. App. No. 15/585462 LENOVO_EDNC_00001989
Excerpts from File History for U.S. Pat. No. 9,277,243 LENOVO_EDNC_00002785
Excerpts from File History for European Pat. Pub. No. 2 082 583 LENOVO_EDNC_00003311
Excerpts from File History for European Pat. Pub. No. 4 224 853 LENOVO_EDNC_00003957
Dabov, K., 2007, August. Image Denoising by Sparse 3-D Transform-Domain Collaborative Filtering. IEEE Transactions on Image Processing (Vol. 16, pp 2080-95). IEEE LENOVO_EDNC_00004186
Richardson, I., 2010. The H.264 Advanced Video Compression Standard (2nd Ed.), WILEY LENOVO_EDNC_00004202

Description and Title of Extrinsic Evidence
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